WHAT IS CLAIMED IS:

1. A method of causing an improvement in function of the central nervous system of a subject having impaired central nervous system function, comprising administering to the subject an aliquot of cells derived from umbilical cord blood.

2. A method of causing an improvement in a function of the central nervous system of a subject, comprising administering to the subject an aliquot of cells derived from blood, the aliquot containing stem cells.

3. A method of causing an improvement in a function of the central nervous system of a subject, comprising administering to the subject an aliquot of cells derived from blood and a growth factor.

4. The method of claim 2 or 3 wherein the cells are derived from umbilical cord blood.

5. The method of claim 2 or 3 wherein the cells are derived from peripheral blood.

6. The method of claim 1, 2 or 3 further comprising obtaining the aliquot of cells by separating a desired cell population from the cord blood.

7. The method of claim 3 wherein the growth factor is selected from the group consisting of oncostatin M and growth factors from the following families: FGF, neurotrophin, IGF, CNTF, EGF, TGF-beta, LIF, interleukins, PDGF and VEGF.

8. The method of claim 1, 2 or 3 further comprising obtaining a sample of cells and purifying the sample to obtain the aliquot.

9. The method of claim 1, 2 or 3 further comprising obtaining a sample of cells and expanding at least a selected population of cells in the sample ex vivo to obtain the aliquot.

10. The method of claim 1, 2 or 3 wherein said aliquot of cells comprises allogeneic cells.

11. The method of claim 1, 2 or 3 wherein said aliquot of cells comprises autologous cells.

12. The method of claim 1, 2 or 3 wherein the improvement results in recovery from a central nervous system trauma.

13. The method of claim 1, 2 or 3 wherein the improvement results in repair of central nervous system damage.

14. The method of claim 1, 2 or 3 wherein the improvement results in repair of central nervous system disease.

15. The method of claim 1, 2 or 3 wherein the improvement results in regeneration of central nervous system tissue.

16. The method of claim 1, 2, or 3 wherein the improvement comprises measurable stroke recovery.

17. The method of claim 1, 2, or 3 wherein the improvement is the result of stroke repair.

18. The method of claim 1 wherein the improvement results from tissue regeneration after a stroke.

19. The method of claim 1, 2 or 3 wherein the improvement results from a genetic element contained in the administered cells.

20. The method of claim 19 wherein the genetic element is endogenous to the administered cells.

21. The method of claim 19 wherein the genetic element has been exogenously added to the administered cells.

22. The method of claim 1, 2 or 3 wherein the improvement comprises head trauma recovery.

23. The method of claim 1, 2 or 3 wherein the improvement comprises head trauma repair.

24. The method of claim 1, 2 or 3 wherein the improvement results from tissue regeneration after head trauma.

25. The method of claim 1 or 2 wherein the cells are administered intercerebrally, intracisternally, intracerebroventricularly, or intraparenchymally.

26. The method of claim 1 wherein the cells are CD 34+/-, Lin- cells or precursor cells.

27. The method of claim 26 wherein the cells are characterized as: $CD2^-$, $CD3^-$, $CD14^-$, $CD16^-$, $CD19^-$, $CD24^-$, $CD56^-$, $CD66b^-$, glycophorin A^-, flk-1^+, $CD45^+$, $CXCR4^+$, MDR^+.

28. The method of claim 1, 2 or 3 wherein the improvement results from treatment of one of the following diseases: Parkinson's Disease, Alzheimer's Disease, Huntington's Disease, ALS, MS, Tay-Sachs, and cerebral palsy.

29. The method of claim 1, 2 or 3 further comprising administering to the subject a cell differentiation factor.

30. The method of claim 1, 2 or 3 further comprising administering to the subject a neural guidance molecule.

31. The method of claim 3 wherein the growth factor is administered intercerebrally, intracisternally, intracerebroventricularly, or intraparenchymally.

32. The method of claim 3 wherein the growth factor is administered with the aliquot of cells.

33. The method of claim 3 wherein the growth factor is administered separately from the aliquot of cells.

34. The method of claim 1, 2 or 3 wherein the aliquot of cells is administered directly to a site of brain injury.

35. The method of claim 13 wherein the damage is due to lack of oxygen to the brain.

36. The method of claim 35 wherein the damage is due to stroke or asphyxiation.

37. A method of causing an improvement in central nervous system function of a patient comprising:

obtaining an aliquot containing a predetermined target population of cells by

(a) introducing a starting sample of cells into a growth medium

(b) causing cells of the predetermined target population to divide; and

(c) concurrently with, intermittently during, or following step (b), contacting the cells in the growth medium with a selection element, so as to select cells of the target population from other cells in the growth medium; and

administering the aliquot to the patient.

38. The method of claim 37 wherein the selection element comprises a plurality of selective binding molecules with affinity either for target cells or for a first population of non-target cells.

39. The method of claim 37 wherein the starting sample is cord blood or is derived from cord blood.

40. The method of claim 37 wherein said aliquot of cells comprises CD 34+/-, Lin- cells.

41. The method of claim 37 wherein said expansion is clonogenic.

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